



# **Concrete Pavement Conference December 4-5, 2001 “Smoothness Initiative”**

Peter Vacura

Chief, Office of Structural Section  
Design and Rehabilitation

Materials Engineering and Testing  
Services

[peter.vacura@dot.ca.gov](mailto:peter.vacura@dot.ca.gov)

# Smoothness Initiative Facts

- Traveling public puts ride quality at the top of the list
- Smoother pavements last longer
- Highway agencies are answering the call

# Smoothness Initiative

## More Facts

- National Quality Institute (NQI) surveyed traveling public in 1996
- Top two responses were safety and ride quality
- A follow up survey in 1999 resulted in the same top two priorities

# Smoothness Initiative

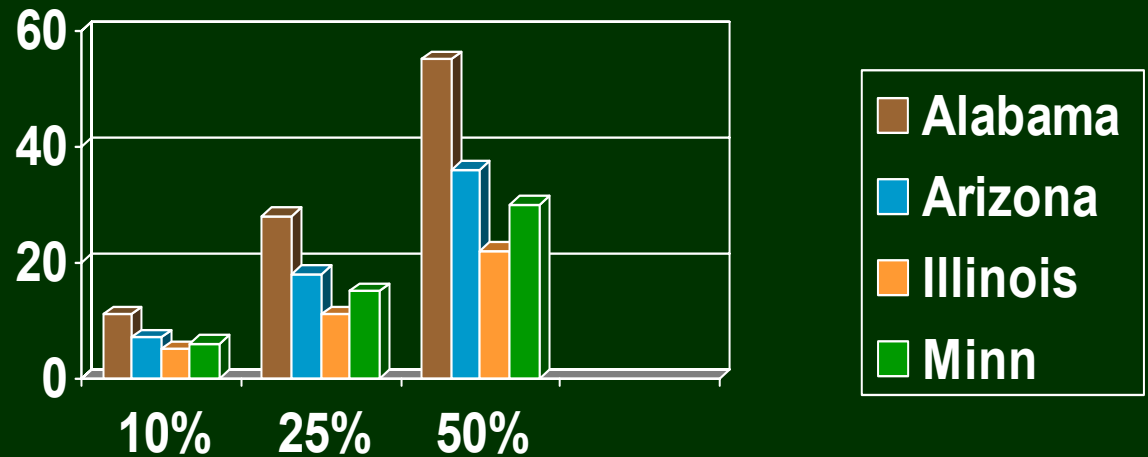
## Initial Smoothness

- Studies have shown that initially smooth pavement last longer
- Four states evaluated Portland Cement Concrete over time

# Smoothness Initiative

## Initial Smoothness

Reduction in Roughness vs  
Increase in Performance Life



# Smoothness Initiative

## Initial Smoothness

- Smoother pavements reduce users costs
  - Fuel consumption
  - Tires and springs
- Results of study performed at Westrack

# Smoothness Initiative

## Measuring Smoothness

- Current methods of measuring smoothness are being improved
  - Profilograph data collection
  - Specification improvement and enforcement
- A few new and innovative ideas are being discussed
  - Inertial Profilers
  - Incentive/Disincentive clauses

# Smoothness Initiative

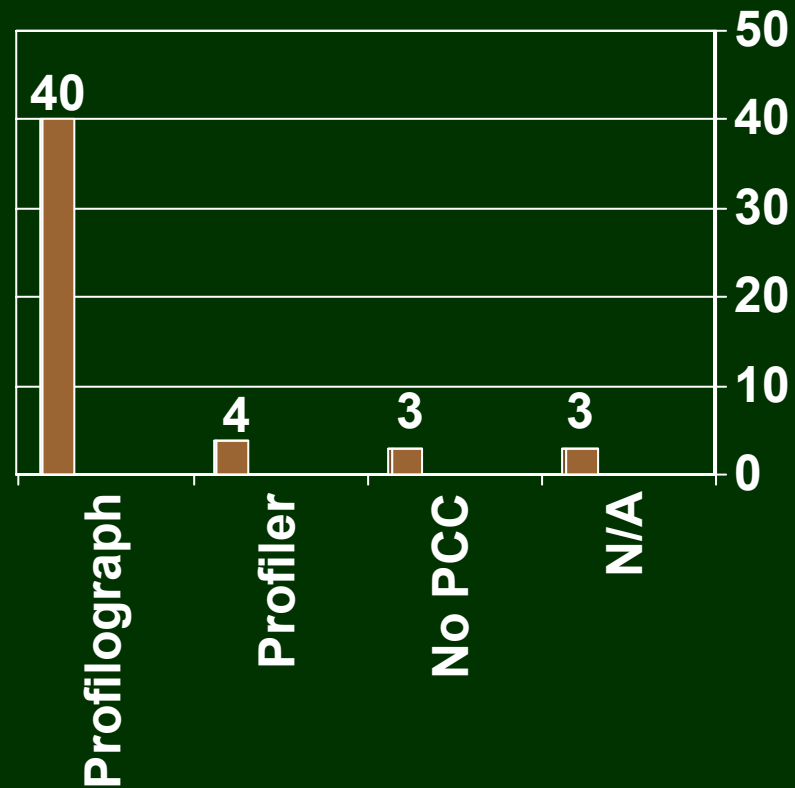
## Smoothness Measuring Devices

- Profilographs are the most commonly used devices for measuring smoothness
- Other devices are the straightedge and the inertial profiler



# Smoothness Initiative

## Smoothness Measuring Devices



# Smoothness Initiative Specifications

- Specifications are being changed
  - Move from a 0.2 in blanking band to a 0.0 in blanking band
  - California Test 526
  - Transitioning from a profilograph to an inertial profiler
  - Pilots by next spring/summer
  - Include incentive/disincentive clause

# Smoothness Initiative Incentive/Disincentive

- 35 States have some form of an Incentive /Disincentive
- Applied in various ways
  - Absolute (5-7 in/mi)
  - Percentage improvement (50-70%)
  - Route type (low vs. high speed)
  - Strategy type (one vs. multiple lifts)

# Smoothness Initiative Indexes

- Change from the Profile Index, “PI” to the International Roughness Index, “IRI”
- Change to “IRI” in order to establish a standard across the country
- Six states have made or are beginning to make a change

# Smoothness Initiative

## Users of Class 1 Profiler

- States that have transitioned from a Profilograph to a Class 1 Profiler
  - Texas (Contractor)
  - Oregon (Contractor)
  - Colorado (Contractor)
  - Washington (Contractor)
  - Pennsylvania (State)
  - Maryland (State)

# Smoothness Initiative Smoothie Award

- Introduction of the “Smoothie” Award
  - Presented annually
  - To the Contractor providing the smoothest pavement
  - Criteria yet to be established

# Smoothness Initiative

## Success of Initiative

- Success will be based on cooperation of Caltrans, Industry and the vendors
- Educating all parties will be the primary objective
- Success will also hinge on proper implementation

# Smoothness Initiative Conclusions

- Answer the call of the traveling public; good ride quality
- Improve the design life of our pavements
- Reduce user costs